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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/824,887	04/02/2001	Brandon L. Fliflet	42390P10580	2061

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EXAMINER	
YANG, RYAN R	

ART UNIT	PAPER NUMBER
2628	

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02/07/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/824,887	FLIFLET, BRANDON L.	
	Examiner	Art Unit	
	Ryan R. Yang	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/31/2007 has been entered.

1. This action is responsive to communications: Amendment, filed on 10/31/2007. This action is non-final.

2. Claims 19-36 are pending in this application. Claims 19, 31 and 34 are independent claims. In the Amendment, filed on 10/31/2007, claims 19, 31 and 34 were amended.

3. The present title of the invention is "Method and apparatus for dynamically balancing graphics workloads on a demand-based zone renderer" as filed originally.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 19-35 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter

which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

As per claims 19, 31 and 34, the specification does not disclose what a "binner" is.

All the dependent claims are rejected for the same above reason.

Claim Rejections - 35 USC § 102

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 19, 22-26, 31 and 34 are rejected under 35 U.S.C. 102(e) as being anticipated by Arenburg et al. (US 6,191,800).

As per claim 19, Arenburg et al., hereinafter Arenburg, discloses a method to balance workloads associated with a binner and renderer, comprising:

configuring a size of a cache associated with the renderer and viewed by the binner (Figure 1 where Temporary Memory 18 contains a cache and the Processor 12 is the binner);

monitoring the binner and renderer for a predefined time period (Figure 4 where 72 monitors the binner and renderer for a time);

detecting whether there is an imbalance between the binner and renderer (Figure 4, item 74 determines the imbalance); and

in response to detecting an imbalance between the binner and the renderer, dynamically adjusting the size of the renderer to minimize the imbalance (Figure 4, item 78 where the size of the renderer is adjusted after the imbalance is determined at 74).

7. As per claim 22, Arenburg demonstrated all the elements as disclosed in the rejected claim 20, and further discloses the maximum size of the cache viewed by the binner is equal or approximately equal to an associated display size (Equation 8 where the mazimum weighting factor is 1 which is the size of the display).

8. As per claim 23, Arenburg demonstrated all the elements as disclosed in the rejected claim 21, and further discloses wherein the minimum size of the render cache viewed by the binner is equal or approximately equal to the size of the cache in the renderer (an approximate solution may be employed by first using Eq. 5 to obtain the initial unconstrained solution. If a tile is found with an area less than A-minimum, then this tile area is set to A-Minimum", column 6, line 22-25).

9. As per claim 24, Arenburg demonstrated all the elements as disclosed in the rejected claim 19, and further discloses monitoring the binner and renderer for a predefined period comprises:

polling the renderer for a predefined number of cycles ("Each tile is updated one frame, and the various times that it takes for each tile to be rendered are measured", column 6, line 65-67, where one frame is a plurality of cycles).

10. As per claim 25, Arenburg demonstrated all the elements as disclosed in the rejected claim 19, and further discloses wherein monitoring the binner and renderer for a predefined period comprises:

determining an execution time for the binner associated with rendering at least one object in relation to total processing time (t(i) of Eq. 3 is rendering time for one object and the total processing time is t(1)+ ... +t(n), in column 5).

11. As per claim 26, Arenburg demonstrated all the elements as disclosed in the rejected claim 19.

As for "maintaining graphics rendering state variables within each zone to minimize imbalances between the binner and renderer", since the area under consideration include bottle, cork an bubbles which are state variables relating to color and geometry attributes, it is inherent that the state variables imbalance between the binner and renderer are minimized.

12. As per claim 31, it claims a machine readable medium having stored therein a plurality of machine readable instructions executable by a processor with limitations similar to claim 19, therefore it is similarly rejected as claim 19.

13. As per claims 34, Arenburg discloses an apparatus for rendering at least one graphics object into an image comprising:

a memory region (Figure 1, item 18);

a rendering engine (Figure 1, item 12); and

the rest of limitations similar to claim 19, therefore is similarly rejected as claim 19.

Claim Rejections - 35 USC § 103

14. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

15. Claims 20-21 and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arenburg et al.

16. As per claims 20-21, Arenburg demonstrated all the elements as disclosed in the rejected claim 19.

As for in response to detecting an imbalance between the binner and the renderer, adjusting the size of the renderer to minimize the imbalance further comprises: increasing or decreasing the size of the zone renderer in response to an imbalance substantially caused by the binner, since it is notoriously well known in the art (Official Notice) that adjusting a size includes increasing or decreasing the size, it would have been obvious to one of ordinary skill in the art to consider both options in order to obtain a size

17. As per claims 32 and 33, Arenburg demonstrated all the elements as disclosed in the rejected claim 31, and since their limitations are similar to claims 20 and 21 respectively, therefore are similarly rejected as claims 20 and 21 respectively.

18. Claims 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arenburg et al. and further in view of Perpiglia (3,905,023).

19. As per claim 27, Arenburg demonstrated all the elements as disclosed in the rejected claim 26.

Arenburg discloses a method of load balancing. It is noted that Arenburg does not explicitly disclose storing fast state variables into selected buffers, however, this is known in the art as taught by Perpiglia. Perpiglia discloses a multiprocessing system in which frequently used variables (fast state variables) are stored into selected buffer

(Figure 4, associative buffer 52) ("The associative memory 52 is a general data buffer implemented to provide fast access to frequently used variables and descriptors which are outside the area contained in the stack buffer 50", column 19, line 35-39).

Thus, it would have been obvious to incorporate the teaching of Perpiglia into Arenburg because Arenburg discloses a method of load balancing and Perpiglia disclose the fast state variables could be stored into selected buffer for the purpose of providing fast access.

20. As per claim 28, Arenburg and Perpiglia demonstrated all the elements as disclosed in the rejected claim 27.

As for storing frequently changed attributes of geometry into selected fast state variable buffers, since attributes of geometry are notoriously well known (Official Notice) variable in computer graphics, it would have been obvious to one of ordinary skill in the art to include it in the in the method in order to provide a faster processing.

21. As per claim 29, Arenburg and Perpiglia demonstrated all the elements as disclosed in the rejected claim 28, and Perpiglia further disclose storing slow state variables into selected buffers (Figure 4, stack buffer 50).

Thus, it would have been obvious to incorporate the teaching of Perpiglia into Arenburg because Arenburg discloses a method of load balancing and Perpiglia disclose the slow state variables could be stored into selected buffer for the purpose of affording fast access to frequently used variables.

22. As per claim 30, Arenburg and Perpiglia demonstrated all the elements as disclosed in the rejected claim 29.

As for storing infrequently changed attributes of geometry into selected slow state variable buffers, since attributes of geometry are notoriously well known (Official Notice) variable in computer graphics, it would have been obvious to one of ordinary skill in the art to include it in the in the method in order to provide a faster processing.

Response to Arguments

23. Applicant's arguments filed 10/31/2007 have been fully considered but they are not persuasive.

Applicant alleges Arenburg does not meet the amended limitation. In reply, Examiner contends since an adjusting mechanism (Figure 4, item 78) is used to adjust the tile geometry to be rendered according to a determining step 74 in a feed back loop, it is dynamically adjusting the size of the renderer. In addition, Examiner cannot find support in the specification for a "binner".

Conclusion

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan R. Yang whose telephone number is (571) 272-7666. The examiner can normally be reached on M-F 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on (571) 272-7664. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Ryan Yang/
Primary Examiner
February 4, 2008